LOUISIANA DEPARTMENT OF WILDLIFE & FISHERIES

OFFICE OF FISHERIES
INLAND FISHERIES SECTION

PART VI -B

WATERBODY MANAGEMENT PLAN SERIES

BARATARIA BASIN

WATERBODY EVALUATION &
RECOMMENDATIONS

CHRONOLOGY

DOCUMENT SCHEDULED TO BE UPDATED ANNUALLY

May 2014 - Prepared by

Tim Ruth, Biologist Manager, District 8
Gary Vitrano, Biologist Manager, District 8

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Gary Vitrano, Biologist Manager, District 8

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WATERBODY EVALUATION

STRATEGY STATEMENT

Recreational
Sportfish species such as largemouth bass (LMB) are managed to maintain a sustainable population while providing anglers the opportunity to catch or harvest adequate numbers of fish to maintain angler interest and efforts.

Commercial
Commercial species are managed with statewide regulations to provide a maximum sustainable yield.

Species of Special Concern
Species of special concern are managed to provide for a sustainable population.

EXISTING HARVEST REGULATIONS

Recreational
Statewide regulations for all fish species. Recreational fishing regulations may be viewed at this link: http://www.wlf.louisiana.gov/fishing/regulations

Commercial
Statewide regulations on all species. Commercial fishing regulations may be viewed at this link: http://www.wlf.louisiana.gov/fishing/regulations

SPECIES EVALUATION

Recreational

Largemouth Bass

Relative abundance, length distribution, relative weight, size structure indices and length-weight relationship
Largemouth bass are utilized as an indicator species for the freshwater fish population due to their trophic position. Electrofishing generally provides good insight into the abundance and size distribution of largemouth bass. Electrofishing does not always effectively sample large bass. Gill net sampling is used to determine the status of large bass and other large fish species.

Catch per unit effort (CPUE) is the term used to describe the number of fish collected during a given time period of sampling. For electrofishing samples, the standard CPUE time period is one hour and the unit is the number of fish captured. CPUE is an index of relative abundance for electrofishing results and is usually displayed as the number of fish captured per hour of sampling effort.

Standardized electrofishing samples have been collected in the Barataria basin by Inland Fisheries Districts 7 and 8 for routine LMB population monitoring, Davis Pond Freshwater Diversion monitoring, a special supervisor project, a LMB mortality study, and coastal intermediate marsh monitoring efforts. Total electrofishing effort throughout all years in the basin is not consistent. Number of samples conducted per season range from 1 to 53 for spring and from 1 to 46 for fall. A summary of electrofishing samples collected within the Barataria basin is found in Barataria MP-A. The CPUE for LMB basin wide is derived from these samples by season and is presented in Figures 1 and 2.

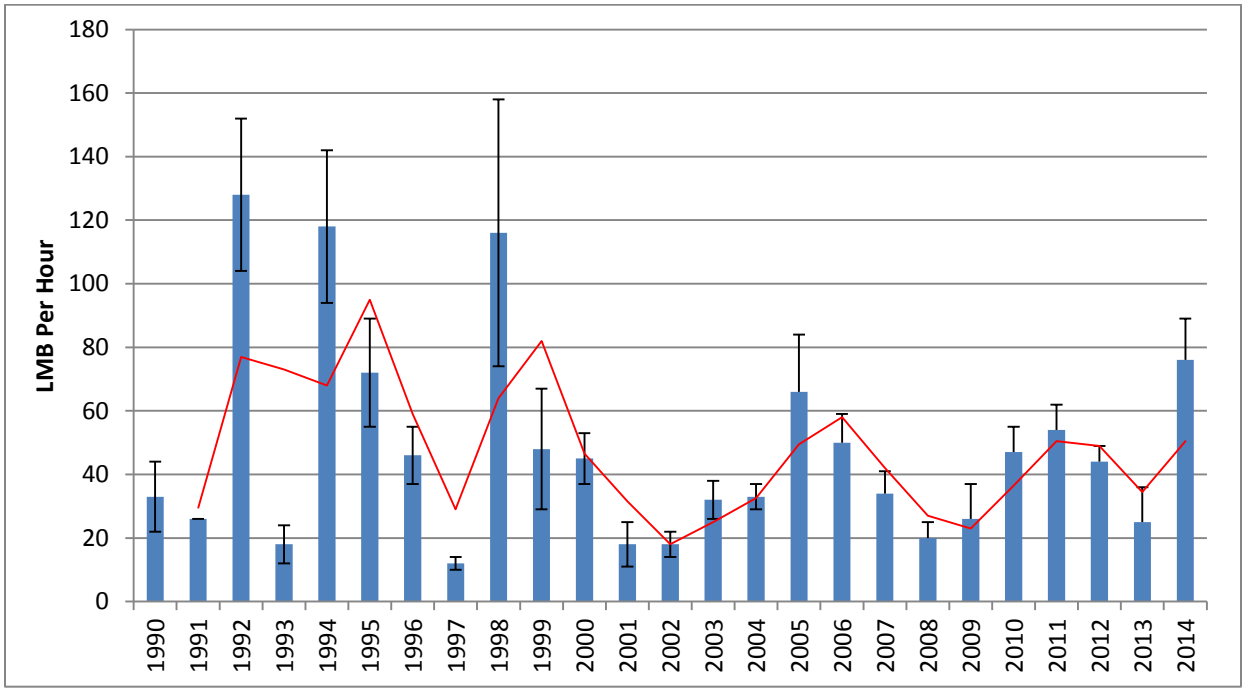


Figure 1. The mean CPUE (+ SE) in number per hour and trend line for LMB from the Barataria Basin, LA from spring electrofishing results for 1990 – 2014.

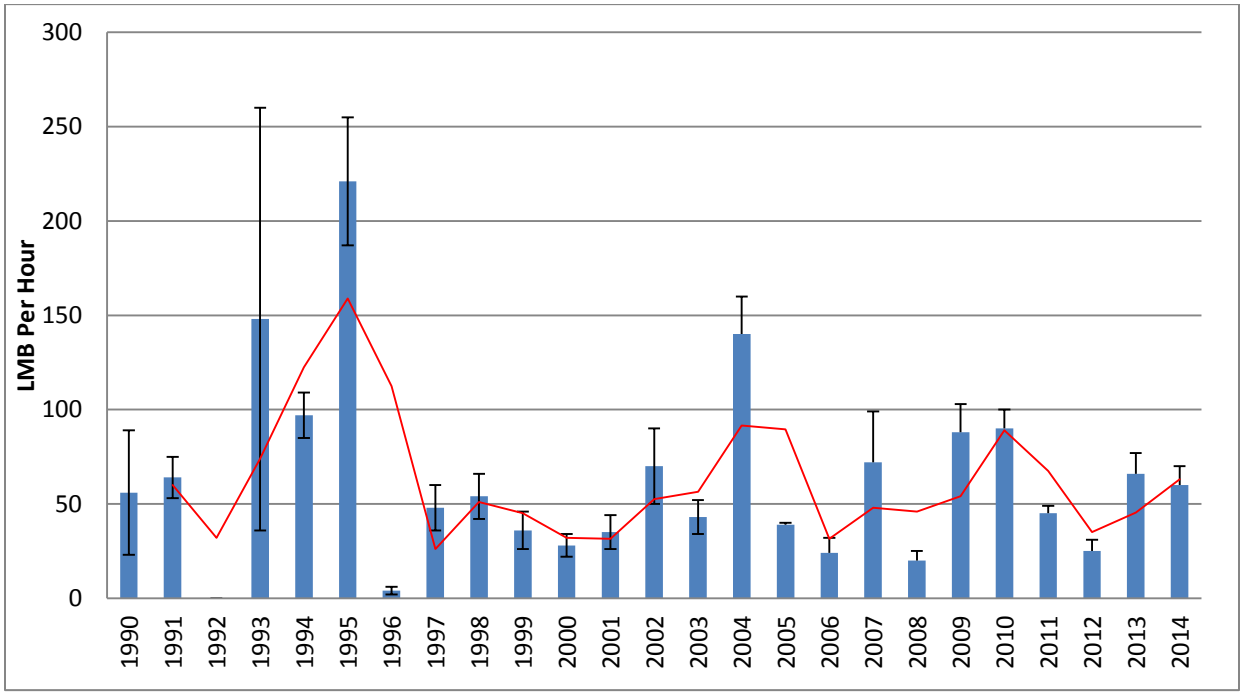


Figure 2. The mean CPUE (± SE) in number per hour and trend line for LMB from the Barataria Basin, LA from fall electrofishing results for 1990 – 2014.

The most recent length distributions for largemouth bass collected in the spring and fall of 2014 in the Barataria basin are presented in Figure 3. The LMB ranged from 3 to 19 inches total length (TL) with 5 and 6 inch young-of-the-year (YOY) bass being the most abundant. Length distributions for LMB collected in both spring and fall of 2014 are presented in Figures 4 and 5, respectively. Mean relative weight (Wr) of LMB sampled in the fall of 2014 is within the acceptable range (i.e., above 80). Wr is the ratio of a fish's weight to the weight of a ''standard'' fish of the same length. The index is calculated by dividing the weight of a fish by the standard weight for its length, and multiplying the quotient by 100. LMB mean relative weights below 80 may indicate a potential problem with forage availability.

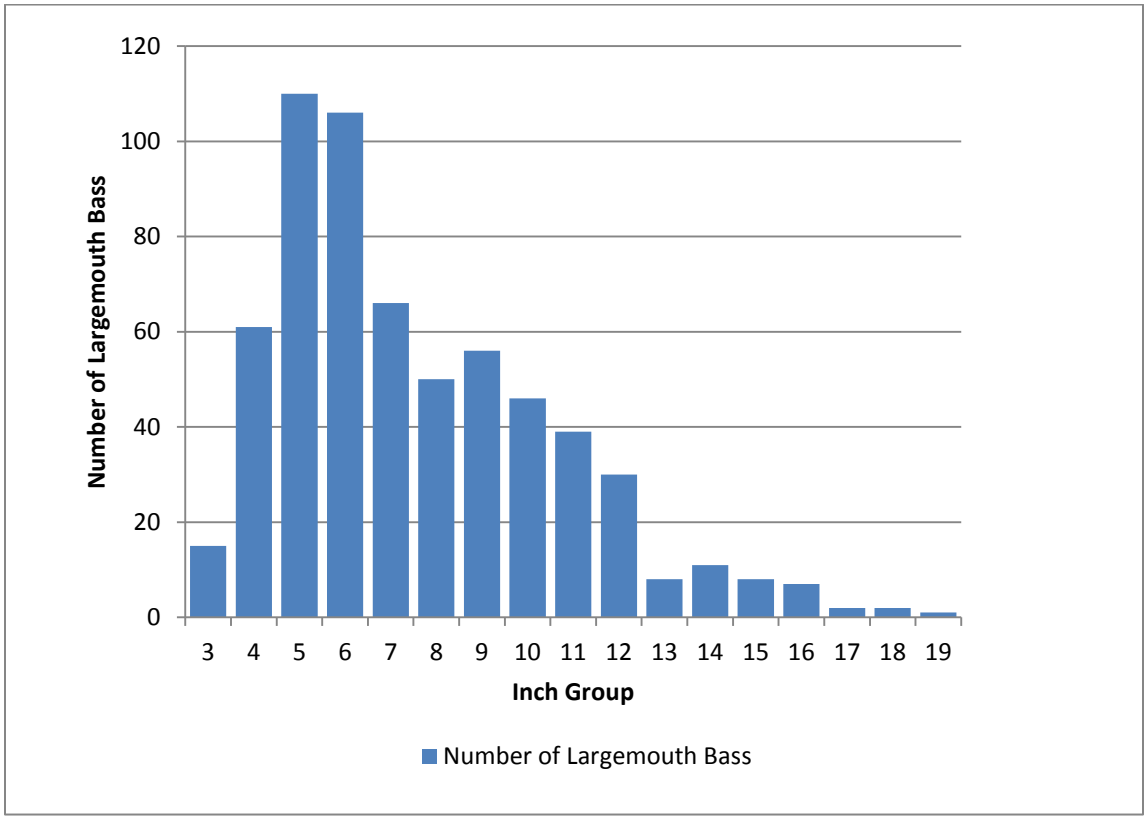


Figure 3. Size distribution by inch group of LMB collected from the Barataria basin in 2014, n=618.

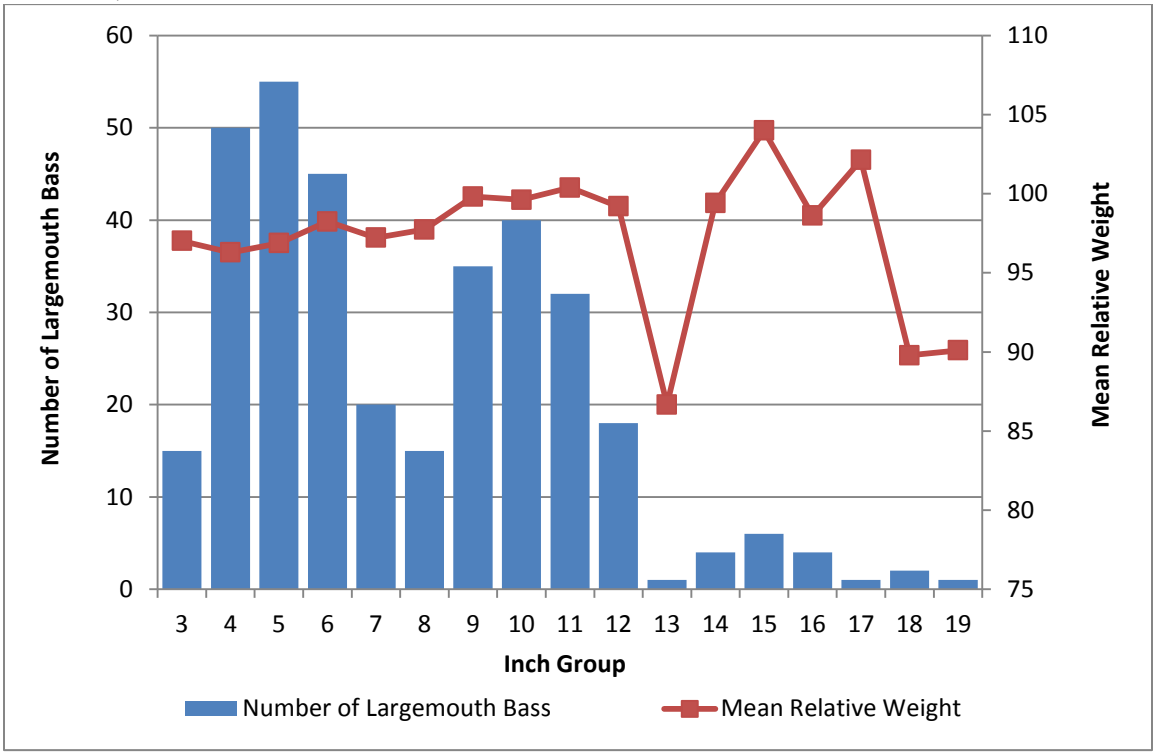


Figure 4. Size distribution and mean relative weight by inch group of LMB collected from the Barataria basin in the fall of 2014, n=344.

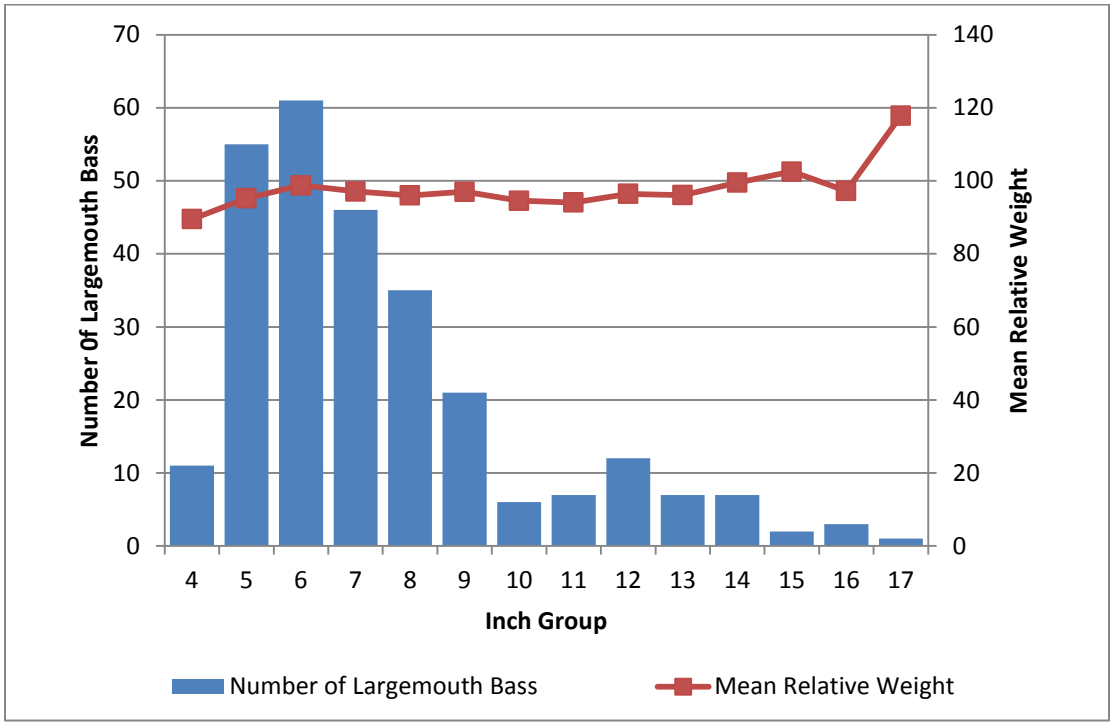


Figure 5. Size distribution and mean relative weight by inch group of LMB collected from the Barataria basin in the spring of 2014, n=274.

Proportional stock density (PSD) and relative stock density (RSD) are indices used to numerically describe length-frequency data (Anderson and Neumann 1996). Proportional stock density compares the number of fish of quality size (> 12 inches for largemouth bass) to the number of bass of stock size (> 8 inches in length). A fish population with a high PSD consists mainly of larger individuals, whereas a population with a low PSD consists mainly of smaller fish. A value between 40 and 70 generally indicates a balanced bass population. Relative stock density (preferred, RSD_{15}) is the percentage of largemouth bass in a stock (fish over 8 inches) that are also 15 inches TL or longer. An RSD_{15} value between 10 and 40 indicates a balanced bass population, while values between 30 and 60 indicate a higher abundance of larger fish. In most years, the Barataria basin's fall and spring samples display low PSD and RSD_{15} values (Figures 6 and 7), which indicate an unbalanced bass population. This may be attributed to a high rate of annual mortality due to environmental and biological factors, e.g., tropical storm activity, variability of aquatic habitat and predation.

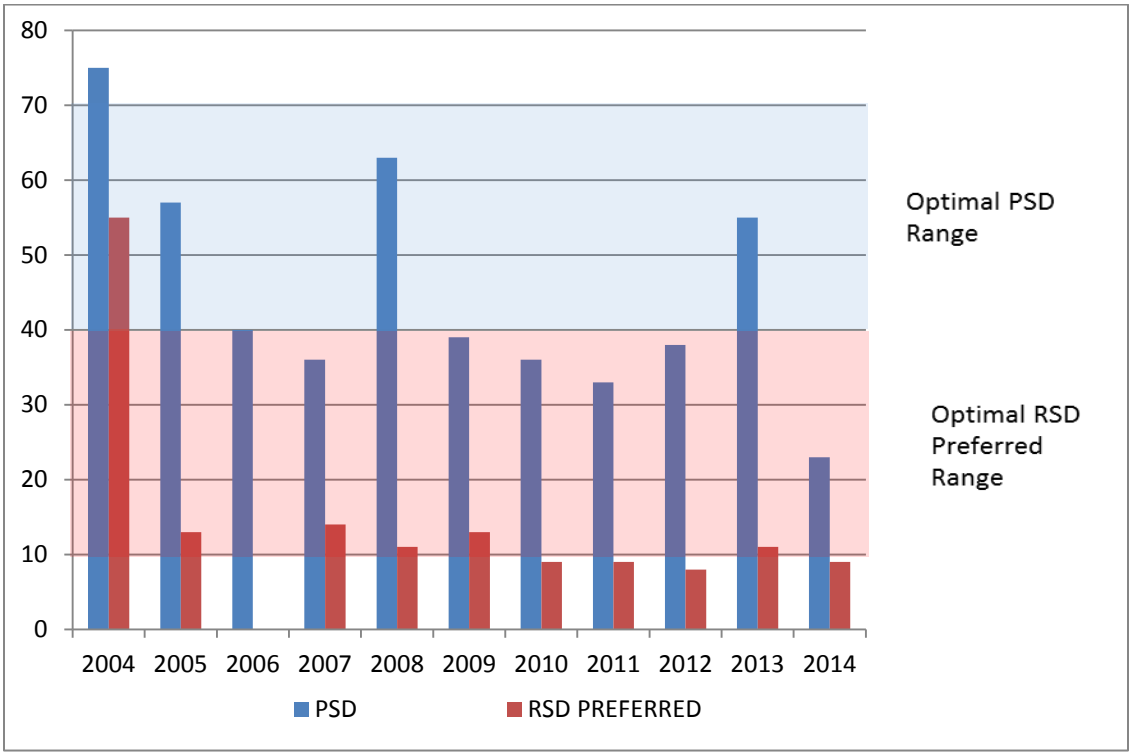


Figure 6. Proportional stock density (PSD) and relative stock density (RSD_{15}) for largemouth bass in the Barataria Basin, LA from fall electrofishing results, 2004 – 2014.

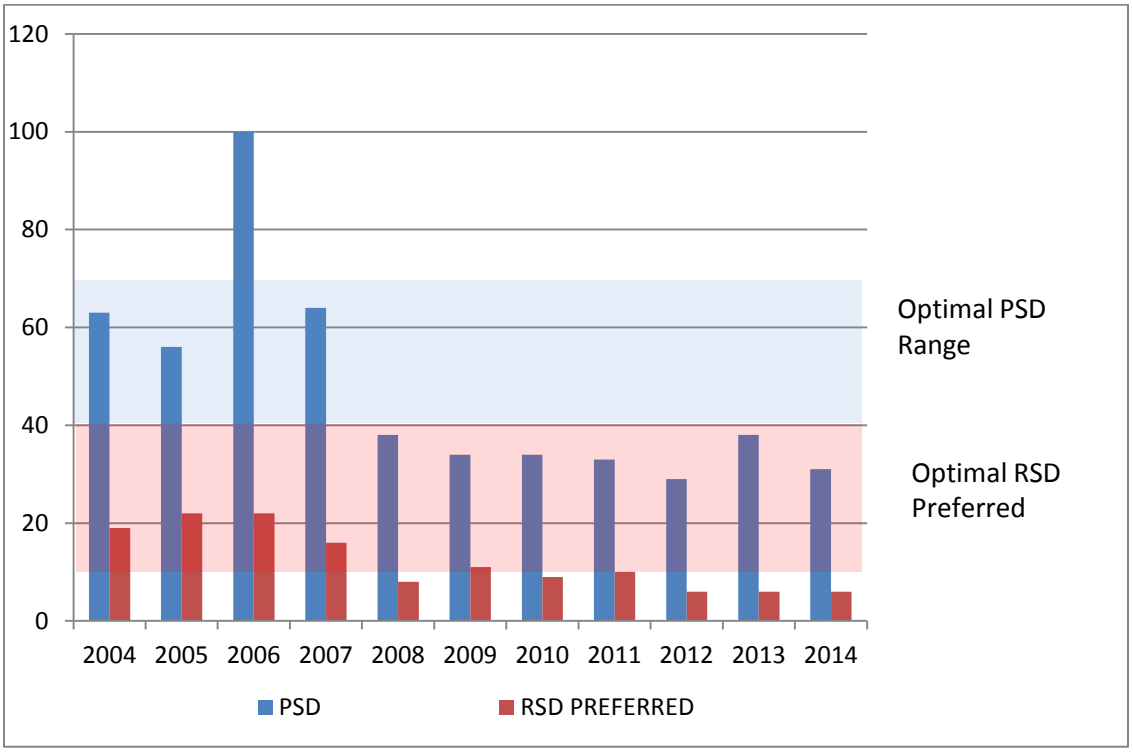


Figure 7. Proportional stock density (PSD) and relative stock density (RSD_{15}) for largemouth bass in the Barataria Basin, LA from spring electrofishing results, 2004 – 2014.

The most recent length distributions for largemouth bass (2014 – spring and fall) from Bayou des Allemands are presented in Figure 8. Bayou des Allemands LMB ranged from 4 to 19 inches TL with good representation of the 5 and 6 inch groups and 10 to 12 inch groups. The 4 to 7 inch fish represent YOY recruits.

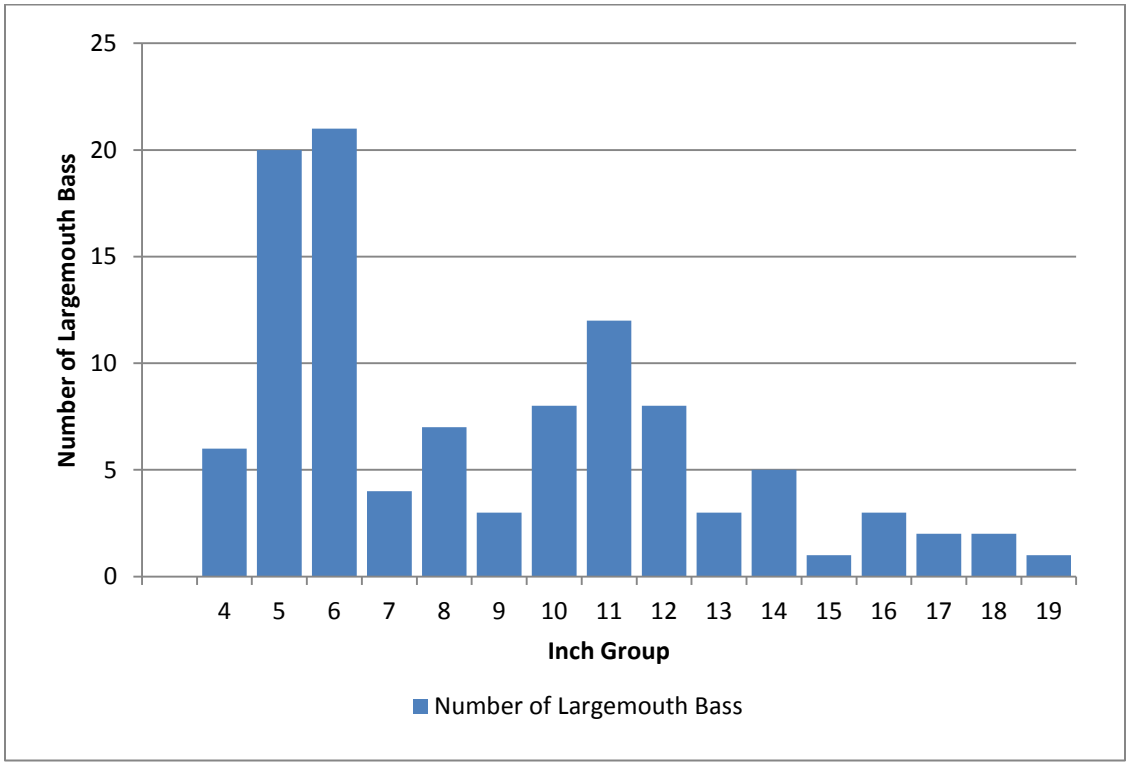


Figure 8. The length distribution (inch groups) of largemouth bass from Bayou des Allemands, LA for spring and fall 2014 electrofishing results. n = 106.

The most recent length distributions for largemouth bass (2014 – spring and fall) from Lake Cataouatche are presented in Figures 9 and 10. Lake Cataouatche LMB ranged from 3 to 16 inches total length (TL) with bi-modal peaks at 6 and 9 inches TL. The 3 to 7 inch fish represent YOY recruits. Length distributions and relative weights for LMB collected in both spring and fall of 2014 are presented in Figures 10 and 11, respectively. Mean relative weight (Wr) of LMB sampled in the fall of 2014 is within the acceptable range (i.e., above 80).

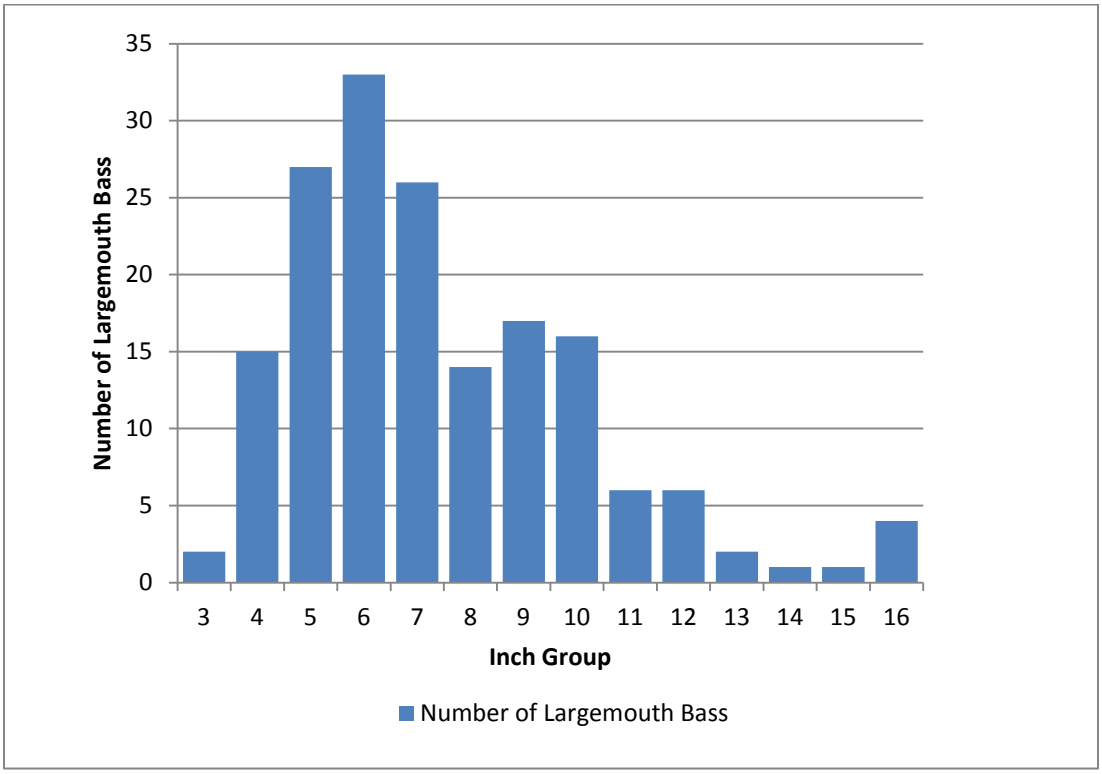


Figure 9. The length distribution (inch groups) of largemouth bass from Lake Cataouatche, LA for spring and fall 2014 electrofishing results (*n* = 170).

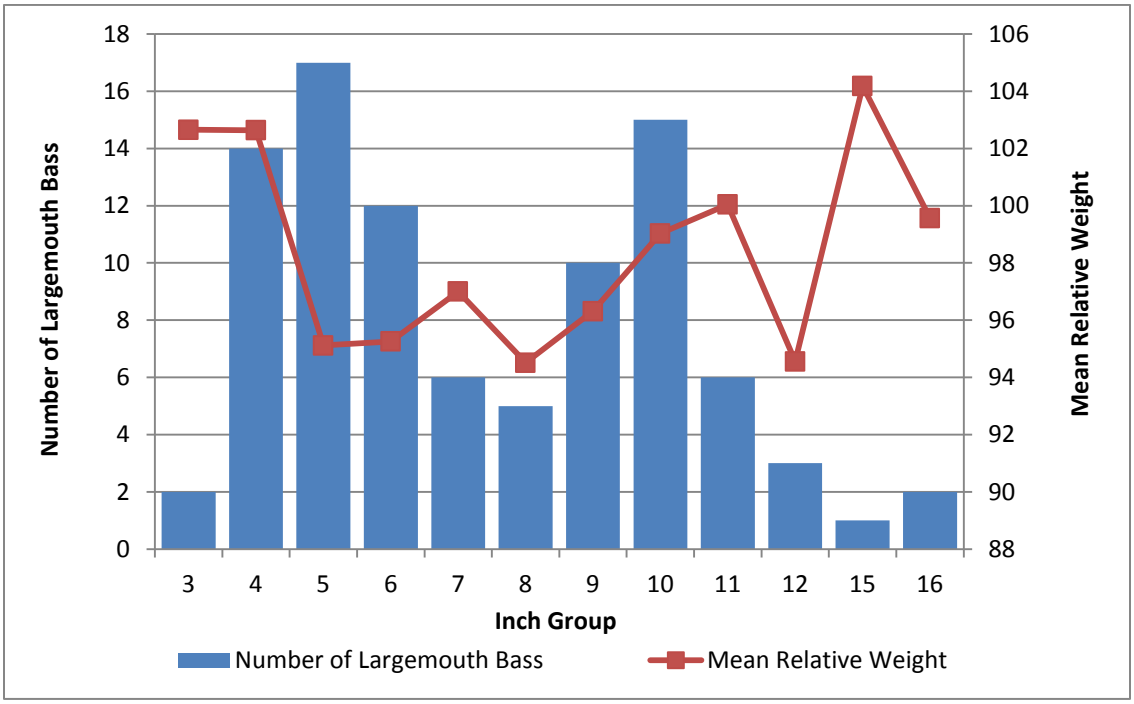


Figure 10. The length distribution and mean relative weights (by inch group) of largemouth bass from Lake Cataouatche, LA for fall 2014 electrofishing results (n = 93).

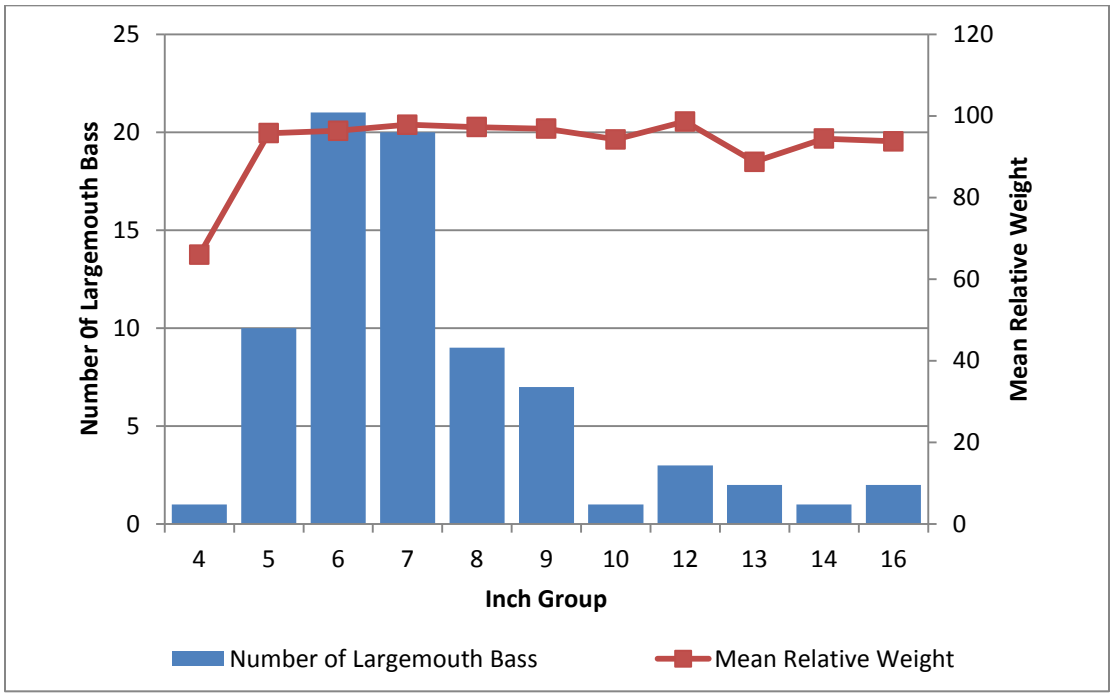


Figure 11. The length distribution and mean relative weights (by inch group) of largemouth bass from Lake Cataouatche, LA for spring 2014 electrofishing results (n = 77).

The observed and predicted weight at total length developed from the Lake Cataouatche spring LMB electrofishing survey (2010-2012) results are presented in Figure 12. The slope in the length-weight equation (3.14) is considered moderate indicating positive weight gains (allometric growth) for largemouth bass in Lake Cataouatche.

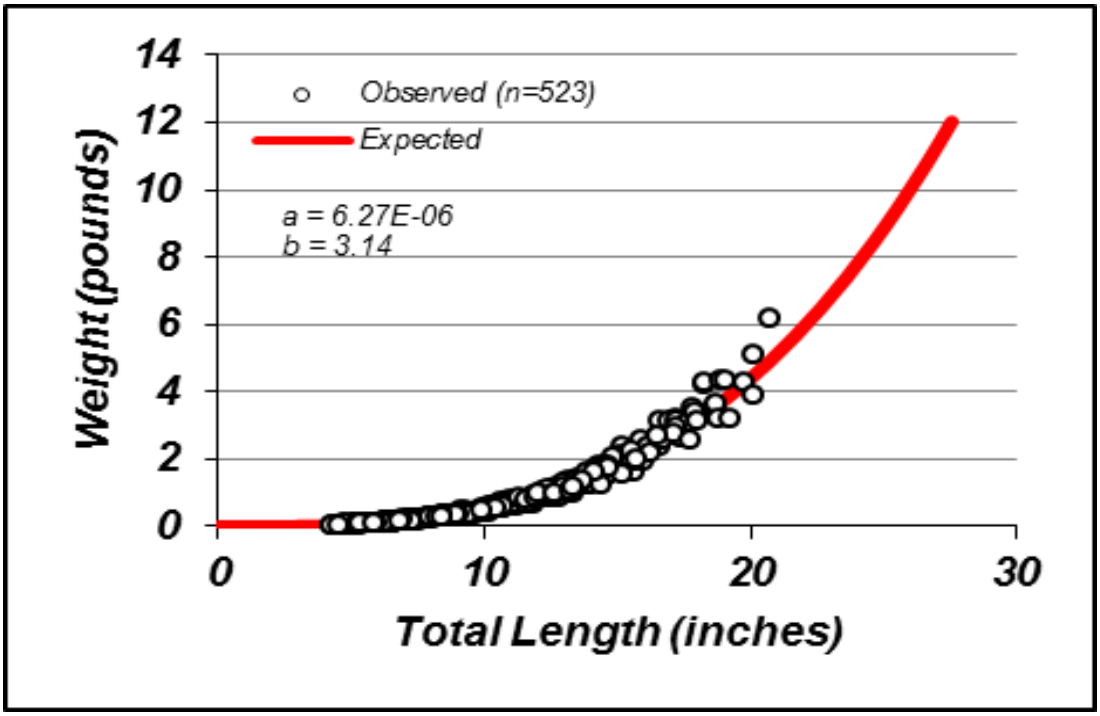


Figure 12. Observed and predicted weight at total length of Lake Cataouatche largemouth bass 2010-2012. Parameter estimates for the power function $W = aL^b$ and sample sizes (n) used in model fitting are presented in each graphic.

LMB Stock assessments

Studies conducted in the estuaries of South Louisiana suggest that LMB occupy a lower trophic level than their counterparts in reservoirs (Meador and Kelso 1990), (LDWF 2013). Nonetheless, LMB are a popular target for recreational anglers in the Barataria Basin. Therefore, LDWF monitors and evaluates the population.

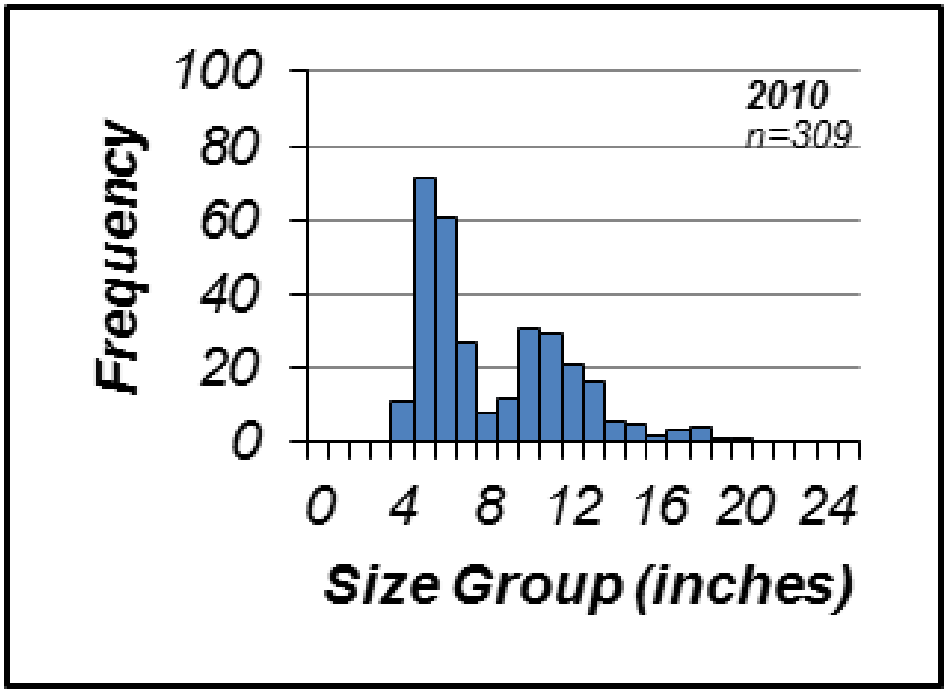
Two evaluations of LMB populations within the Barataria Basin were completed in 2012. A three year evaluation of LMB in and around Lake Cataouatche was completed by LDWF staff. Researchers from Nicholls State University (NSU) also completed a comparison of the LMB populations in Lake Des Allemands and Lake Cataouatche.

The NSU study compared relative abundance, gonadosomatic index (GSI), gonad histology, and age and growth over a one year period between both lakes. Results from the NSU study indicated no significant difference in all population parameters measured except diet. LMB from Lake Cataouatche had a higher proportion of fish in their stomachs in the spring than from either lake during any other season. NSU results also indicate LMB spawn at the end of March and beginning of April in both lakes.

Fish populations are influenced by a number of factors including, but certainly not limited to fishing pressure. Catastrophic events of both natural and anthropogenic origin impact the Barataria Basin fish population. A thorough understanding of those influences and the corresponding population response is essential to good fisheries management. As part of a statewide effort, LDWF recently completed a stock assessment to describe the Lake Cataouatche LMB population. The project included data collection over a three year period from 2010–2012.

Population characteristics including relative abundance, growth, body condition, mortality, and longevity were measured. Lake Cataouatche anglers were also surveyed to determine their collective influence on the LMB population. Electrofishing gear was used by fisheries biologists to collect LMB from Lake Cataouatche each spring. Length and weight measurements were recorded for each fish and ear bones (called otoliths) were removed from approximately 43% of the sampled fish for age and growth analyses. Annual growth rings on the otoliths provide an accurate measurement of fish age. Size and age for all of the sampled fish were combined to generate estimates of average growth rate and longevity. Angler surveys were conducted during the sample period to document fishing effort, angler catch rate and harvest rates.

Figure 13 illustrates that Lake Cataouatche supports a healthy but short lived bass population with few LMB reaching 20 inches. Good representation of fish in the 5 to 12 inch range was observed in 2011 and 2012. It is important to note that spring sampling typically does not include fingerling size bass. However, the recurring presence of small (age-1) bass indicates consistently successful reproduction.



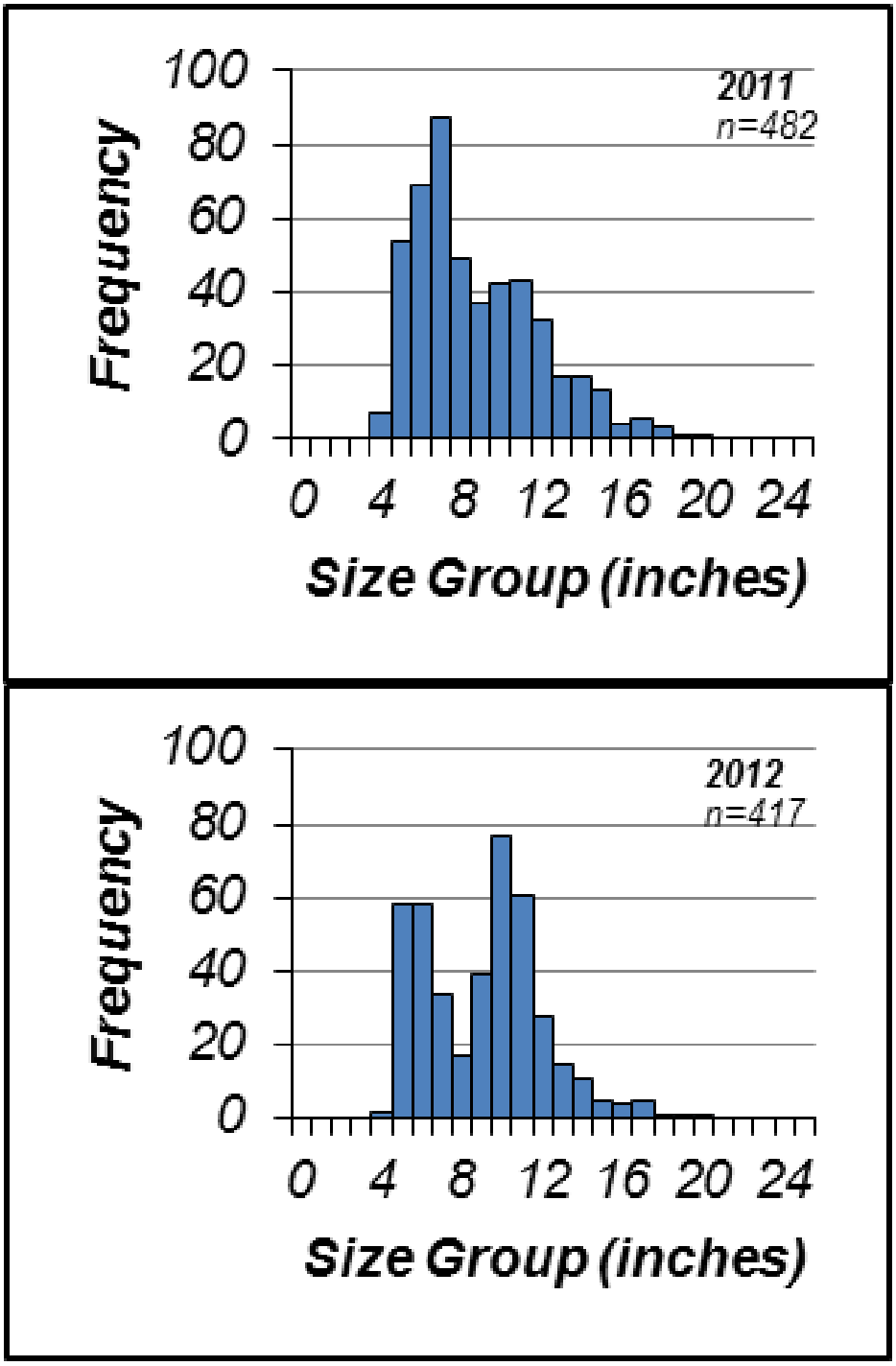


Figure 13. Annual length frequency distributions of the Lake Cataouatche largemouth bass spring electrofishing survey 2010-2012. Sample sizes (n) are presented in each graphic.

Age structure of the complete electrofishing sample (2010-2012) is shown in Figure 14. While bass up to 7 years old were found, only a small percentage of Lake Cataouatche LMB sampled were 3 years old and older. Average length at age for Lake Cataouatche bass is provided in Table 1. Growth of LMB in Lake Cataouatche is considerably slower than other Louisiana waters (Figure 15). Body condition for Lake Cataouatche LMB can be described as moderately robust.

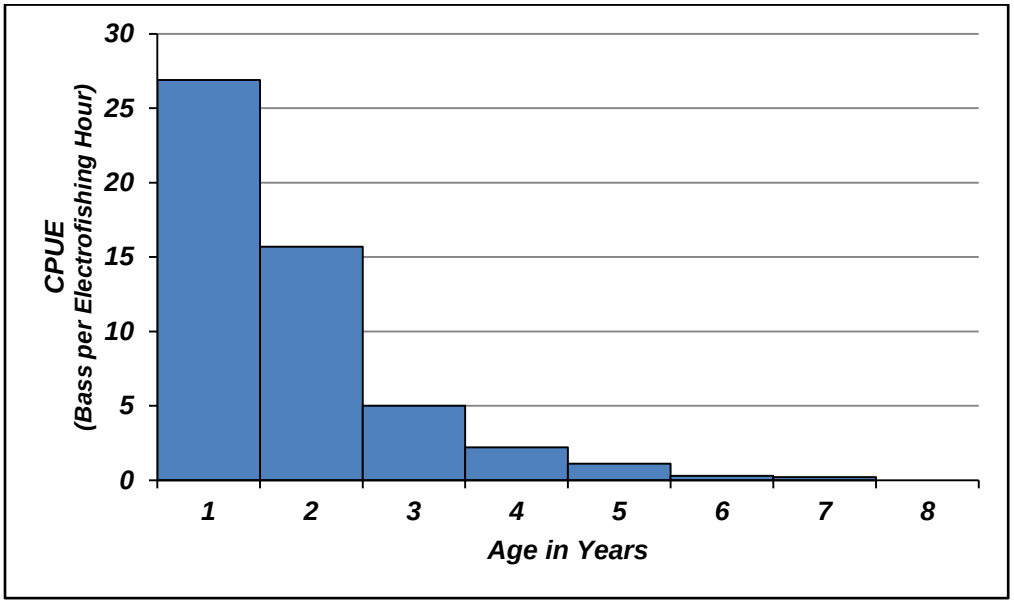


Figure 14. Age structure of Lake Cataouatche, LA LMB for 2010 – 2012.

Table 1. Average length at age of LMB collected in 2010-2012.

Age	Length in Inches
1	6.1
2	10.3
3	13.0
4	14.6
5	16.1
6	17.2
7	19.2

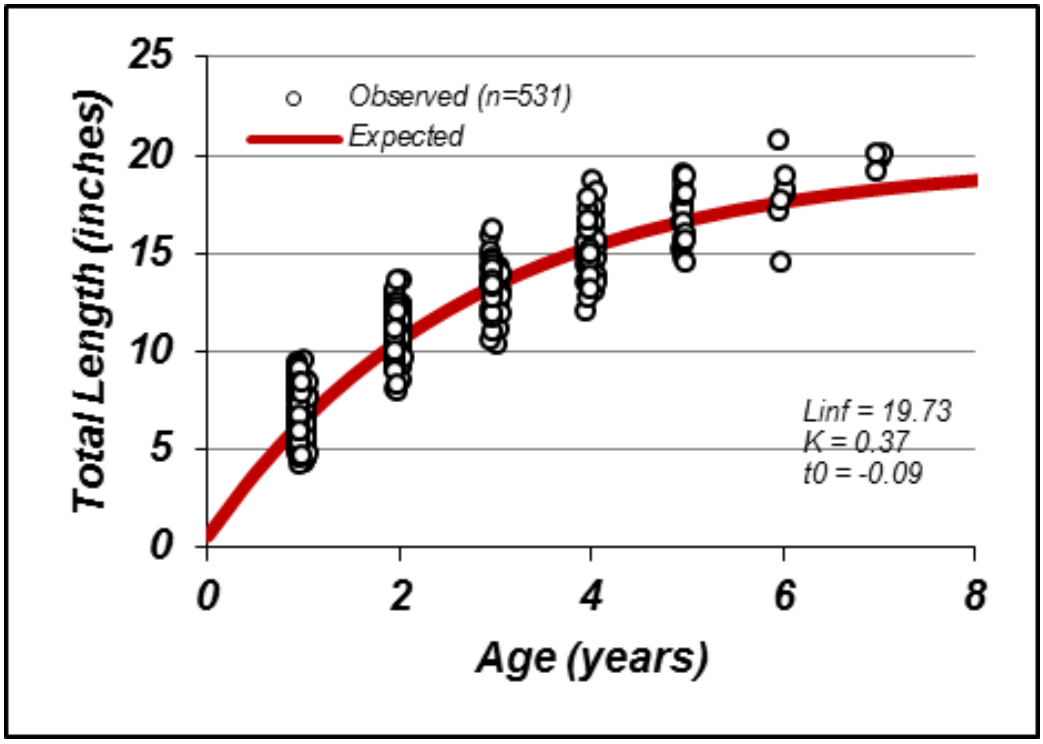


Figure 15. Observed and predicted total length at age of Lake Cataouatche largemouth bass (2010-2012). Von Bertalanffy parameter estimates and sample sizes (n) are presented in each graphic.

The rate at which fish die each year is referred to as mortality. Mortality consists of two parts: natural mortality (predation, disease) and fishing mortality (angler harvest and discard mortality). Results of the study indicate that the total mortality rate for Lake Cataouatche LMB is 59% per year. At that rate, if you start with 100 age-1 Lake Cataouatche bass, only 3 will remain alive by age 5.

The results of this study suggest that the Lake Cataouatche LMB population has a total mortality that is more influenced by natural factors than by fishing mortalities (35% and 25%, respectively). The fishing mortality rate for Lake Cataouatche LMB is 25% per year. This rate comes from two sources; 1) harvest and 2) post release mortality. LDWF creel survey results indicate that Lake Cataouatche anglers voluntarily release a much larger percentage of LMB than they harvest (75% are released).

It is important to note that fish populations are not only influenced by fishing effort, but also by human and environmental factors. The type and degree of human activity within watersheds, riparian zones, and specific waterbodies can affect LMB populations by altering critical habitats. The construction of Mississippi River main line levees and the closure of Bayou Lafourche at Donaldsonville ceased the input of freshwater and sediment. Navigation canals like the Barataria Waterway, Wilkinson Canal, the GIWW and the hundreds of miles of oil field canals plus natural processes such as subsidence and sea-level rise have increased saltwater intrusion and shoreline erosion. To mitigate for these changes, siphons and diversions have been constructed. The Davis Pond Freshwater Diversion (DPFD) initially stimulated growth of submersed aquatic vegetation in Lake Cataouatche, but also has contributed to its decline. Other highly influential factors include water turbidity and tropical storms. Thoughtful attention to the interaction of influential factors in this dynamic ecosystem is critical to an understanding of the Lake Cataouatche fish population.

Length distribution, age structure, growth rate, and mortality rate of Lake Cataouatche LMB indicate a slow growing, short lived population. The population is more influenced by natural factors than fishing related mortalities. Angler regulations for the Lake Cataouatche LMB fishery currently include a ten fish per day harvest limit with no length restrictions. The dynamics of the Lake Cataouatche LMB population and the current characteristics of Lake Cataouatche anglers are such that change from the current regulations would have a relatively insignificant effect on the population.

Largemouth bass genetics

Stocking of Florida largemouth bass fingerlings began in the aftermath of Hurricane Andrew. Florida bass have been stocked into the Barataria Basin to incorporate the genetic trait associated with larger maximum sized adult fish. Though some stocked Florida bass do survive and grow to large size, genetic testing of largemouth bass stocks from 2001 to 2012 have indicated that the Barataria Basin complex is not a favorable habitat for Florida bass survival. Fewer than 4% of sampled bass were Florida bass during any year tested (Table 2). High sampling catch rates following hurricanes (Figure 2), along with genetic results, indicate that the native largemouth bass population recovers rapidly from the frequent and extensive fish kills. Competition from the resilient native bass population is the primary contributor to the poor success of Florida bass introductions. Genetic testing results for largemouth bass are shown in Table 2.

Table 2. Results of genetic analysis of LMB populations for Lake Des Allemands and Lake Cataouatche, LA, within the Barataria Basin, 2001-2012.

Water Body	Year	Sample Size	Northern	Florida	Hybrid	Florida Influence
Lake Des Allemands	2001	21	91.3%	0	8.7%	8.7%
	2009	27	85%	0	15%	15%
Lake Cataouatche	2010	256	89%	0%	11%	11%
	2011	131	81%	2.3%	16.7%	19%
	2012	119	82%	4 %	14%	18%

Forage

Forage for LMB in the Barataria Basin includes vertebrate and invertebrate species. Diet analyses of LMB in Lake Cataouatche and Lake Des Allemands include fish, shrimp, crawfish, crab, insects and detritus (Boudreaux 2012).

Crappie

Results of LDWF standardized electrofishing samples within the basin reveal a crappie fishery dominated by black crappie. Only 64 white crappie individuals have been collected in 24 years of electrofishing sampling from 1990 to 2014. Mean total CPUE of black crappie collected in standardized electrofishing samples from 1990 to 2014 is presented in Figures 16 and 17. Standardized electrofishing samples may not be the most efficient means of estimating crappie abundance. In 2009, District 8 experimented with lead nets in Lake Boeuf and Bayou Boeuf. Most of the area survey from Lake Bouef to Lake Des Allemands was considered too shallow for safe net placement. However, two successful sets were made. Results from these samples are presented in Table 4. A lead net study in Lake Des Allemands or Lake Cataouatche is recommended if a more accurate estimate of crappie abundance is needed.

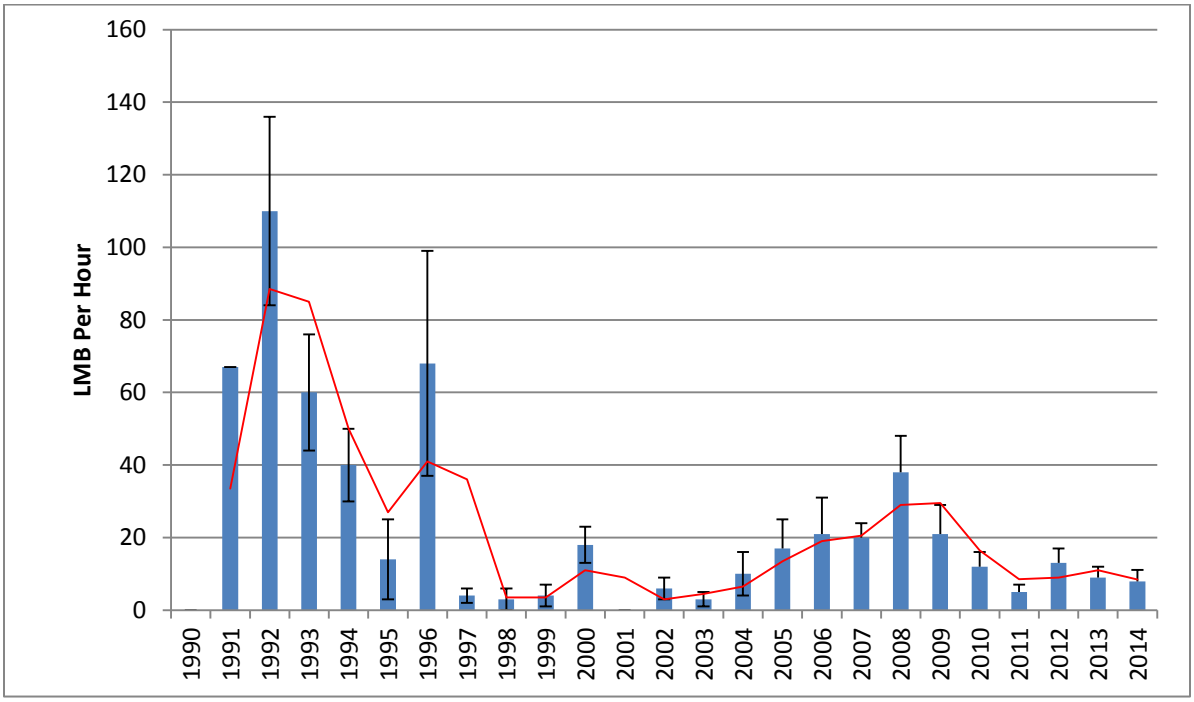


Figure 16. The mean CPUE (± SE) for black crappie from the Barataria Basin, LA from spring electrofishing results for 1990 – 2014.

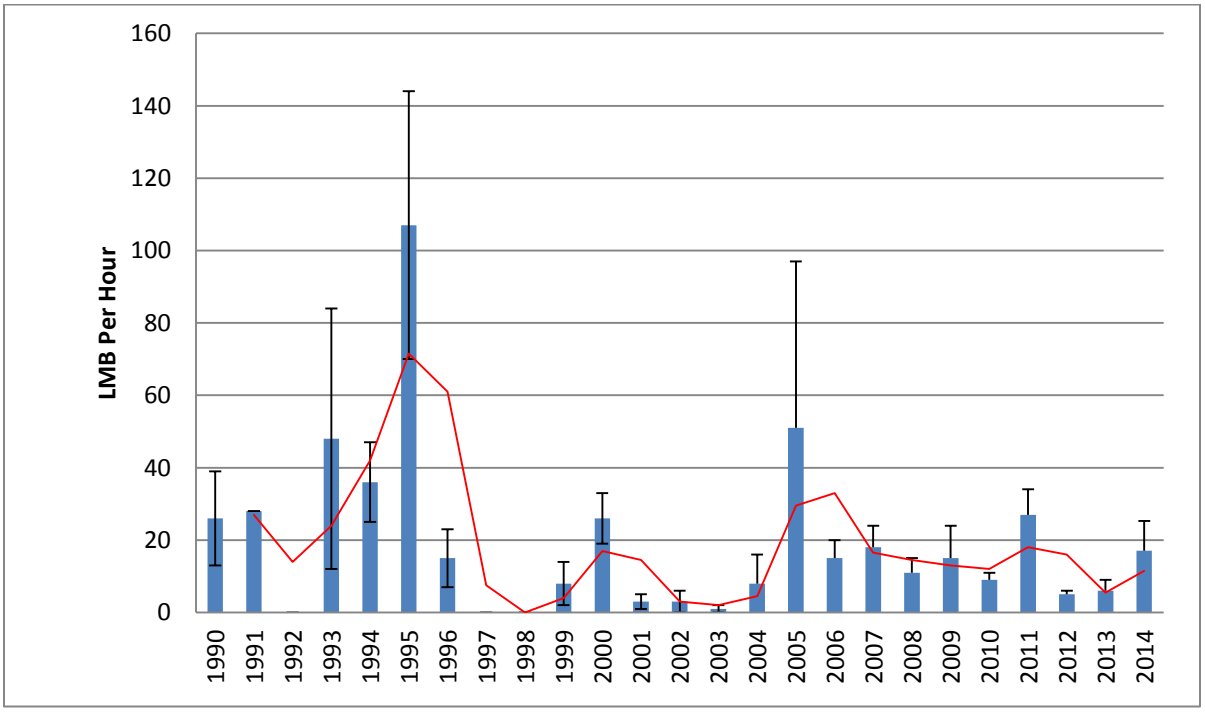


Figure 17. The mean CPUE (+ SE) for black crappie from the Barataria Basin, LA from fall electrofishing results for 1990 – 2014.

Table 4. Results from a 2009 lead net survey for crappie on Lake Bouef and Bayou Bouef, LA.

Inch Group	Total Number	Crappie Catch per Hour
5	39	0.271
6	12	0.083
7	9	0.063
8	3	0.021
9	7	0.049
10	5	0.035
12	2	0.014

Creel Survey

A LDWF random access point survey of anglers including four angler opinion questions was conducted for Lake Cataouatche from August 2010 through July 2011. Surveys were conducted at Pier 90 and Bayou Segnette boat launches. Results indicate that 24.8% of captured LMB were retained for harvest by LMB anglers. There is currently no minimum size limit for LMB in effect for the Barataria Basin. Tables 5 and 6 summarize results of the survey. The angler opinion questions with corresponding angler responses are listed in **APPENDIX I**.

Table 5. Number of creel days, interviews, anglers interviewed and estimated number of LMB anglers with standard error for Lake Cataouatche, LA. From a one year random access point survey conducted in 2010-2011.

Actual Number of Interview Days	Actual Number of Interviews	Actual Number of Anglers Interviewed	Estimated Number of Largemouth Bass Anglers	Standard Error
56	230	403	15,293	4,337.82

Table 6. Estimated LMB caught, harvested and released with corresponding standard error for Lake Cataouatche, LA. From a one year random access point survey conducted in 2010-2011.

Number of Largemouth Bass Caught	Standard Error	Number of Largemouth Bass Harvested	Standard Error	Number of Largemouth Bass Released	Standard Error
48,969	13,024.1	12,157	4,713.4	36,812	10,952.12

Commercial

An evaluation of channel catfish population characteristics was conducted in Lake Des Allemands and Lake Maurepas from 1985-1987 (McElroy et al. 1990). Repeated requests from commercial fishermen to lower the commercial channel catfish minimum size limit regulation prompted the study. Fishermen suggested that the population was stunted and that additional harvest was needed. Results from the age, growth and maturity study indicated the channel catfish population in Lake Des Allemands reached sexual maturity at 360-379 mm TL which was similar to other commercially important stocks in Louisiana (Tilyou 1984). Lake Maurepas channel catfish matured at smaller sizes, but were not found to be short for their ages. The authors suggested neither population was stunted but may be effected by the physicochemical attributes of the mesohaline environment in which they live.

Species of Special Concern

An evaluation of species of special concern has not been conducted.

HABITAT EVALUATION

Aquatic Vegetation

Lake Des Allemands and bayous of the upper basin (Boeuf, Grand, and Chevreuil) are lined with Cypress and Tupelo trees. The spoil banks of manmade canals and bayous of the middle basin also support tree species like black willow, Chinese tallow, sugarberry, and live oak. Emergent plants such as bull tongue, bulrush, cattail, alligator weed, primrose and cutgrass are found along the shoreline of most freshwater bayous, marshes and lakes in the basin. *Spartina patens* dominate the brackish and saline marshes of the lower basin.

Submerged aquatic vegetation (SAV) performs several key ecological functions including providing food and habitat for aquatic animals, decreasing wave action, increasing sedimentation and stabilizing sediments. SAV abundance is known to be directly related to the carrying capacity of aquatic animals. Porrier et al. 2009 reported seven native and three exotic species of SAV present in an evaluation of the Jean Lafitte National Historical Park and Preserve. The study included the eastern portion of Lake Cataouatche and adjacent bayous and canals of the Preserve. SAV has declined significantly in and around Lake Cataouatche since Porrier's study.

The decline of SAV in the basin has reduced habitat for LMB and anglers are reporting reduced catches. Various factors have been suspected in the decline of SAV habitat in Lake Cataouatche. A combination of natural and man-induced perturbations is likely to have caused the loss of SAV. Impacts to SAV from the *Deepwater Horizon* oil spill are still being investigated. Violent wave action and salt water intrusion from Hurricanes Gustav and Ike in the fall of 2008 affected much of the SAV habitat. . SAV coverage continued to decline from 2008-2012 and has shown no indication of re-establishment. Operation of the Davis Pond Freshwater Diversion (DPFD) provided the freshwater necessary for a proliferation of SAV from 2003 to 2005. However, increased mean annual discharge beginning in 2006 and modifications to the ponding area are highly influential to decline of SAV. Figure 18 below shows mean annual discharge of the DPFD in cubic feet per second.

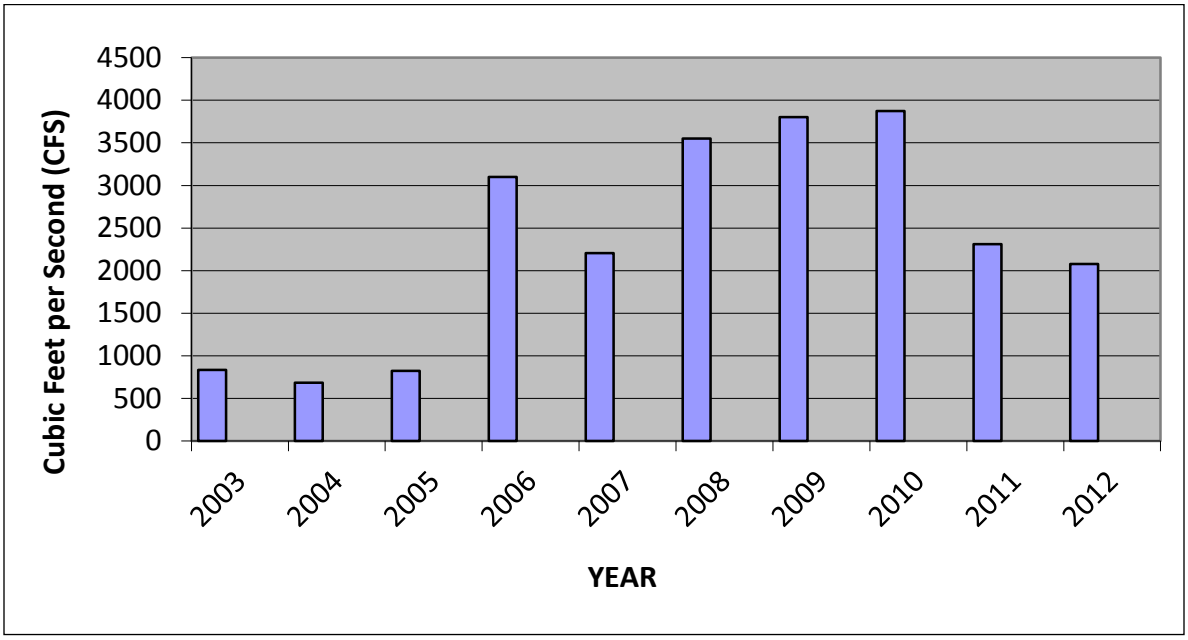


Figure 18. The mean annual discharge (CFS) at Davis Pond Diversion Structure for 2003-2012.

Modification of the DPFD 9,200 acre ponding area completed in 2009 to facilitate water flow has altered its original function. These modifications include, cuts in the Lake Cataouatche shore line protection (gabion weir), deepening and widening of the natural channels and two large cuts (500') in the Cypress canal levee. Analyses of turbidity data at three different sites in Lake Cataouatche have indicated an increase in light attenuation from 2006 to present (Figures 19-21). The availability of light is one of the most important factors affecting SAV persistence and survival (Dennison et al. 1993).

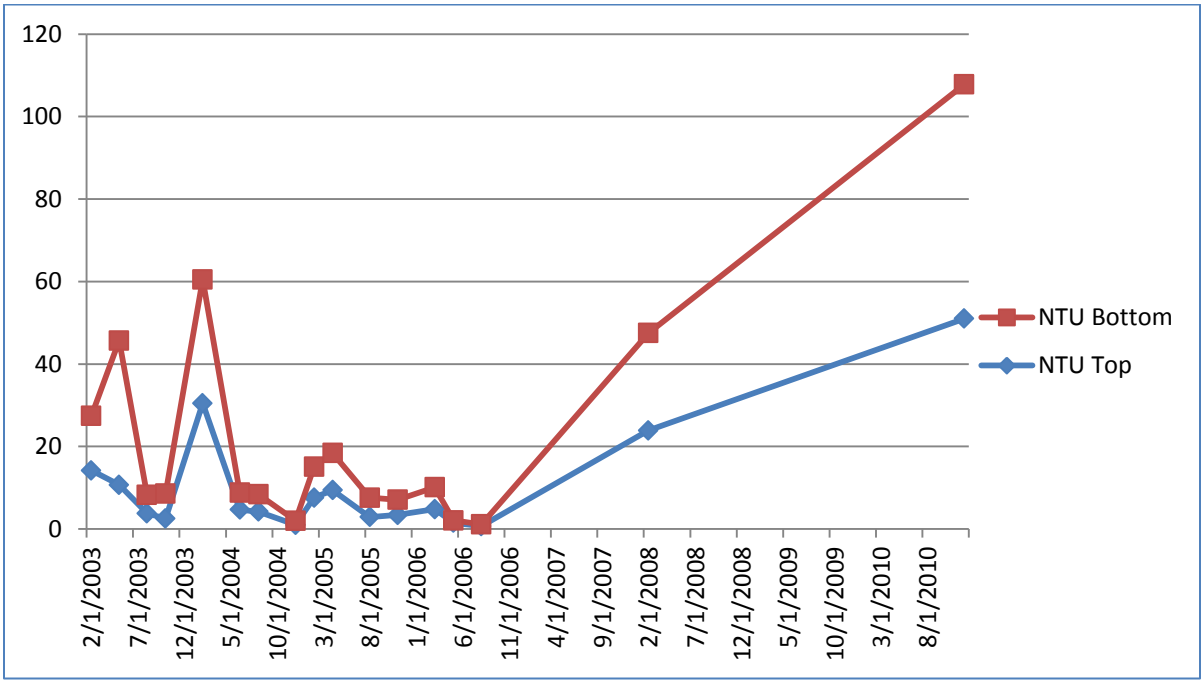


Figure 19. Top and bottom turbidity NTU at sample site 4001 (29.82611 N; -90.2525 W).

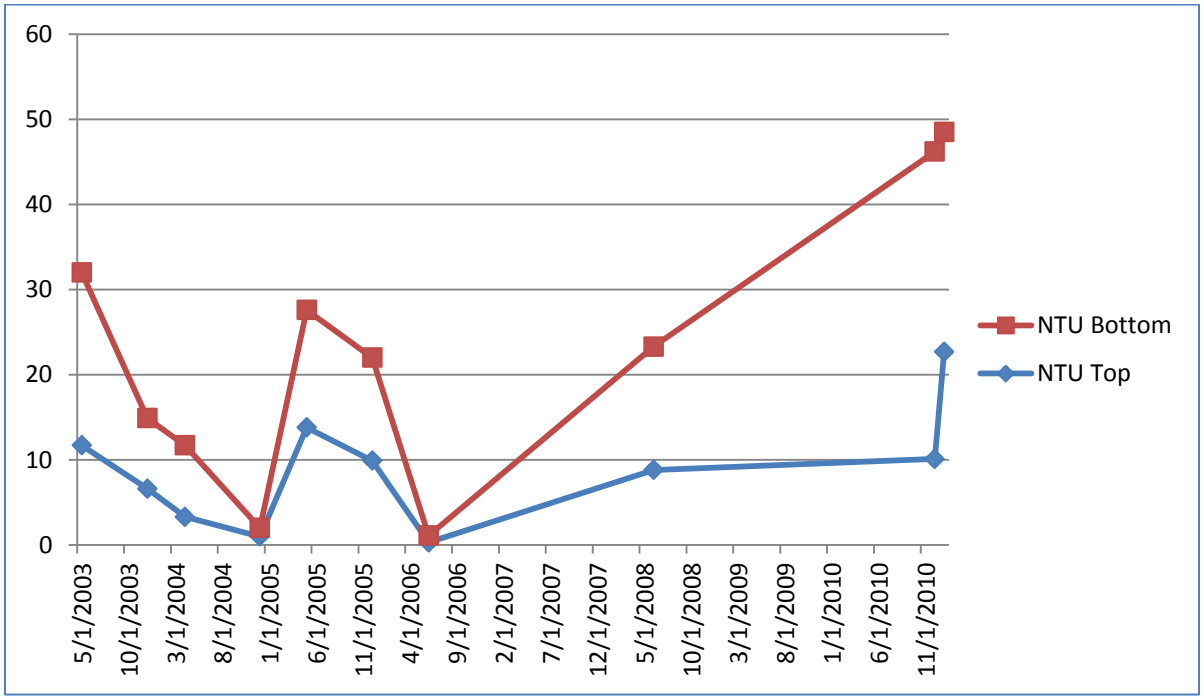


Figure 20. Top and bottom turbidity NTU at sample site 4003 (29.84333 N; -90.27222 W).

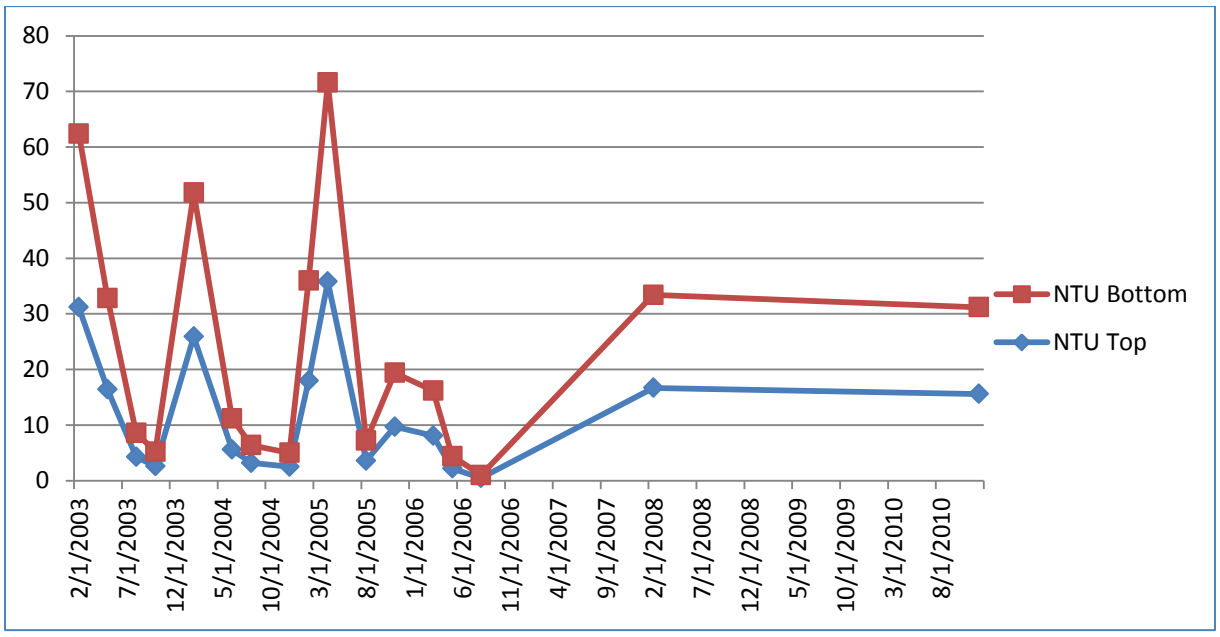


Figure 21. Top and bottom turbidity NTU at sample site 4004 (29.86194 N; -90.22889 W).

Nuisance vegetation in the basin consists primarily of floating plants, including water hyacinth and giant salvinia. Other nuisance plants include alligator weed, water primrose, pennywort, Cuban bulrush and common salvinia. In December 2013, approximately 20,000 acres of water hyacinth, 6,000 acres of giant salvinia, 2000 acres of alligator weed, and 1000 acres of common salvinia were estimated to be present within the basin. Several hard freezes in January 2014 provided significant control to those plants.

Substrate

Substrate within the basin varies, but is primarily characterized as soft and highly organic. Woody debris, stumps from remnant cypress-tupelo forests and Rangia shell beds are present and

do provide suitable spawning substrate for nesting sportfish.

CONDITION IMBALANCE / PROBLEM

The Barataria Basin is a complex and dynamic ecosystem providing resources and opportunity to diverse user groups. Fine scale problems affecting LMB populations in the basin include eutrophication, excessive turbidity, predation, habitat loss (SAV decline), invasive species and storm related fish kills. Efforts that focus on basin-wide ecosystem conservation, restoration and improvement will benefit LMB and other exploited fish populations.

CORRECTIVE ACTION NEEDED

A greater understanding of the complex interactions that limit SAV abundance and distribution is needed. The acquisition of additional physical data in areas affected by the DPFD and other freshwater diversions would be beneficial in determining their impacts on fisheries.

RECOMMENDATIONS

1) Aquatic vegetation Control recommendations for 2015:

   Chemical Control
   This area requires continuous foliar herbicide applications to maintain public access. Treatments will be made in accordance with LDWF Aquatic Herbicide Application Protocol. Water hyacinth will be treated at a rate of 0.5 gallons per acre with 2,4-D with a non-ionic surfactant (1 pt./acre). Giant salvinia will be treated with a mixture of glyphosate (0.75 gal/acre) and diquat (0.25 gal/acre) with Aqua King Plus (0.25 gal/acre) and Air Cover (12oz/acre) surfactants as needed. Monthly scouting trips will be conducted to determine if, when, and where contract spraying will be conducted.

   Biological Control
   We recommend continued supplemental stocking reinforce populations of giant salvinia weevils. Other locations for weevil release will be considered as conditions dictate, and as weevils and manpower are available.

2) Recent evaluations of LMB population and fishery characteristics within the Barataria Basin reveal a slow growing, short lived population with high natural mortality. These characteristics define a population with the least potential to benefit from length limit regulations. Therefore, no length limit regulations for LMB in the Barataria Basin are recommended at this time.

3) Natural mortality due to environmental disruptions may limit largemouth bass (LMB) populations in coastal areas. Periodic hurricanes and tropical storms often interrupt natural regimes and disturb aquatic habitats of the basin. Widespread fish kills are associated with

such events. A common LDWF response to such kills was to evaluate the extent of the kill and restock to enhance recovery of the fish population. Largemouth bass were the most commonly stocked species in those efforts. The current approach includes an evaluation of natural recovery, with restocking and/or harvest restrictions to be applied in the event that natural recovery is determined to be inadequate.

4) Continued evaluation of LMB population characteristics in the Basin.

5) Examine the current potential for SAV production in the basin. Freshwater diversions and siphons are a large component of the basin's hydrology. Understanding their effects on water quality and light attenuation is important. Light attenuation limits growth of SAV in some areas. Monitoring components of light attenuation such as turbidity and chlorophyll *a* would aid in quantifying thresholds in which SAV is productive. Adding these parameters to existing constant recording devices or acquiring and locating devices owned and operated by LDWF is an alternative. The U S Army Corps of Engineers also acknowledges that water quality effects are one of the key uncertainties associated with river diversions and recommends adding nitrogen and phosphorus to the list of parameters routinely measured (Teal et al 2012).

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APPENDIX I

Lake Cataouatche Creel Survey Questions

Question1
Do you fish for largemouth bass in Lake Cataouatche and/or surrounding area?
A) yes
B) no

A	307
B	80
N/A	6
TOTAL	393

Question 2
Which of the following best describes your largemouth bass fishing on Lake Cataouatche?
A) Release them all
B) Keep them all
C) Keep the big ones, release the small ones
D) Keep the small ones, release the big ones
E) other

A	89
B	37
C	58
D	113
E	10
N/A	86
TOTAL	393

Question 3
Which of the following largemouth bass regulations would you prefer to fish under?
A) 10 fish daily per person
B) 5 fish daily per person

C)protective slot limit (release all fish within the slot)
D) minimum length limit (release all fish below limit)
E) maximum length limit (release of all fish above limit)
F) Other

A	146
B	24
C	48
D	33
E	9
F	19
N/A	114
TOTAL	393

Question 4
Overall, how satisfied are you with freshwater fishing In Louisiana?
A) not at all satisfied
B) slightly satisfied
C) moderately satisfied
D) very satisfied
E) extremely satisfied

A	1
B	5
C	74
D	182
E	85
N/A	46
TOTAL	393